

REMARKS

The above amendments to the above-captioned application along with the following remarks are being submitted as a full and complete response to the Office Action dated September 20, 2005. In view of the above amendments and the following remarks, the Examiner is respectfully requested to give due reconsideration to this application, to indicate the allowability of the claims, and to pass this case to issue.

Status of the Claims

Claims 1-5 and 7-18 are currently pending in this application. As outlined above, claims 1 and 4 are being amended to correct formal errors and to more particularly point out and distinctly claim the subject invention. Also, claim 6 is being canceled without prejudice or disclaimer. Applicant hereby submits that no new matter is being introduced into the application through the submission of this response.

Formal Objections or Rejections

Claim 4 was objected to for a minor informality for which the Examiner provided suggested changes to overcome his objection. As outlined above, claim 4 is being amended in accordance with the Examiner's suggestions.

Prior Art Rejections

The Examiner rejected claim 1 under 35 U.S.C. § 102(b) as being anticipated by the Japanese Reference No. H11-087831 to Iwamoto. The Examiner also rejected claims 1, 2, 4, 5, 7, 14 and 18 under 35 U.S.C. § 102(e) as being anticipated by US Application No. 2002/0024153 A1 to Yoshida et al.

Further, the Examiner rejected claims 3, 6 and 8 under 35 U.S.C. § 103(a) as being unpatentable over Yoshida '153 in view of US Patent No. 5,296,717 to Valster. The Examiner also rejected claim 11 under 35 U.S.C. § 103(a) as being unpatentable over Yoshida '153 in view of US Patent No. 5,354,707 to Chapple-Sokol et al.; claim 15 as being unpatentable over Yoshida '153 in view of US Patent No. 6,394,655 to Hayashi; claim 16 as being unpatentable over Yoshida '153 in view of US Patent No. 6,741,538 B2 to Momoo et al; and claim 17 as being unpatentable over Yoshida '153 in view of US Patent No. 5,625,729 to Brown.

The present invention as recited in claim 1 is directed to an optical head characterized by a light source formed of an indirect semiconductor laser having a an active layer structure and an asymmetric quantum well structure, a lens for focusing a light beam from the light source onto a medium, and a detector for detecting a reflected light beam from the medium.

As recited in claim 4, the present invention is directed to an optical head characterized by a semiconductor laser having an active layer made of an indirect semiconductor mixed crystal material, and a detector for detecting a reflected light beam from a medium.

Further, as recited in claim 5, the present invention is directed to an optical head characterized by a recording laser, and a reproducing laser provided independent from the recording laser, the reproducing laser being an indirect semiconductor laser.

Among its main features, the present invention is directed to the provision of a light source formed of an indirect semiconductor laser having an active layer structure and an asymmetric quantum well structure. In one embodiment of the present invention, the asymmetric quantum well structure has a band structure which is left-right asymmetric, as shown in Figs. 6 and 7, with respect the center of the quantum well structure. With such an asymmetric quantum well structure, the gravitational centers of the layer s in which electrons and holes are confine are different from each other, resulting in electric field variation, and accordingly, it is possible to ensure a constant probability of optical transition.

Yoshida '153 fails to disclose or suggest a semiconductor having a light source using an indirect semiconductor laser having an asymmetric quantum well structure. At best, this reference only shows a light source having an indirect semiconductor laser (see paragraph [0041]). As a result, this reference cannot anticipate each and every feature of the present invention as claimed obvious to one of skill in the art.

In addition, Applicant will submit that none of the secondary references provides any disclosure, teaching or suggestion to make up for the deficiencies in Yoshida '153 such that the combination of Yoshida '153 with any of the secondary references could embody every feature of the claimed invention. In particular, Valster '717 only shows a configuration in which an active layer has a multiple quantum well structure and fails to disclose any asymmetric quantum well structure (see column 6, lines 26 to 29). Similarly, Chapple-Sokol, Momoo '538, Hayashi '655 and Brown '729, which are cited for specific features in the dependent claims, all do not disclose, teach or suggest an asymmetric quantum well structure as in the present invention. Consequently, none of the cited references, either individually or in combination, can anticipate or render obvious the present invention as claimed.

Allowable Subject Matter

Claims 9, 10, 12 and 13 were considered allowable by the Examiner pending their amendment into rewritten into independent form to include the limitations of their base claim and any intervening claims. Applicant thanks the Examiner for his consideration in this case. However, in view of the above-outlined amendments and arguments, Applicant believes that the claims and this application now as a whole is condition for allowance.

Conclusion

In view of all the above, Applicant respectfully submits that certain clear and distinct differences as discussed exist between the present invention as now claimed and the prior art references upon which the rejections in the Office Action rely. These differences are more than sufficient that the present invention as now claimed would not have been anticipated nor rendered obvious given the prior art. Rather, the present invention as a whole is distinguishable, and thereby allowable over the prior art.

Favorable reconsideration of this application as amended is respectfully solicited. Should there be any outstanding issues requiring discussion that would further the prosecution and allowance of the above-captioned application, the Examiner is invited to contact the Applicant's undersigned representative at the address and phone number indicated below.

Respectfully submitted,

Stanley P. Fisher
Registration Number 24,344

Juan Carlos A. Marquez
Registration Number 34,072

REED SMITH LLP
3110 Fairview Park Drive
Suite 1400
Falls Church, Virginia 22042
(703) 641-4200

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